

### AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for producing DNA, which comprises the following steps (1) to (68):

(1) dividing a DNA target sequence which has a length of 1000 nucleotides or less ~~and is a nucleotide sequence of DNA to be synthesized~~ into 2N sections, wherein N is a positive integer ~~more greater~~ than 1, ~~of sections~~;

(2) designing partial sequences ~~each~~ having a length of 80 to 150 nucleotides ~~and containing a nucleotide which comprise the sequences of each of one of the sections of step 1~~ and a part of a nucleotide sequence of an adjacent section or parts of nucleotide sequences of adjacent sections, wherein the part or parts have such a length that the nucleotide sequence of the each part can ~~specifically make base pairing~~ base pair with a nucleotide sequence complementary thereto;

(3) preparing oligomers comprising each ~~having each~~ of the 1<sup>st</sup> to Nth partial sequences of step (2) from the 5' end of the target sequence;

(4) preparing ~~and~~ oligomers each having comprising a nucleotide sequence complementary to each of the (N+1)th to (2N)th partial sequences from the 5' end of the target sequence;

(45) performing a polymerase chain reaction ~~by using an~~ the oligomer of step (3) having the Nth partial sequence from the 5' end of the target sequence and an oligomer of step (4) having a nucleotide sequence complementary to the (N+1)th partial sequence from the 5' end of the target sequence under ~~such a conditions~~ such that these oligomers ~~should~~ act as primers and templates for a polymerase enzyme in the polymerase chain reaction;

(5a6) sequencing synthesized DNAs, and

(5b7) selecting DNA having a nucleotide sequence containing the Nth and (N+1)th partial sequences from the 5' end of the target sequence; and

(68) repeating the following steps (6a8a) and (6b8b) and (68c) for ~~J~~ successive J's, wherein J increases for by a single integer for each repetition, and wherein J is an integer, to be from 1 to N-1;

(6a8a) performing polymerase chain reaction by using the selected DNA, an oligomer having the (N-J)th partial sequence from the 5' end of the target sequence and an oligomer having a nucleotide sequence complementary to the (N+1+J)th partial sequence from the 5' end of the target sequence under such a condition that the DNA and oligomers should act as primers and templates, and

(6b8b) sequencing synthesized DNAs, and

(68c) selecting DNA having a nucleotide sequence containing the (N-J)th to (N+1+J)th partial sequences, thereby producing DNA having the target sequence.

2. (Currently amended) A method for producing DNA, which comprises the following steps (1) to (48):

(1) dividing a DNA target sequence which is a nucleotide sequence of DNA to be synthesized into  $2^n$  sections wherein n is a positive integer of 2 to 4, of sections,

(2) designing partial sequences each containing comprising a nucleotide sequence of each of one of the sections of step 1 and a part of a nucleotide sequence of an adjacent section or parts of nucleotide sequences of adjacent sections, wherein the part or parts have such a length that the nucleotide sequence of each part can specifically make base pairing base pair with a nucleotide sequence complementary thereto, and

(3) preparing oligomers each having comprising an each of (odd number)th partial sequences and the part for base pairing of step (2) from the 5' end of the target sequence, and

(4) preparing oligomers each having comprising a nucleotide sequence complementary to each of (even number)th partial sequences and the part for base pairing of step (2) from the 5' end of the target sequence,

(25) repeating the following step (2a5a) for j, wherein j increases by a single integer for each repetition and wherein j is an integer, to be from 1 to  $2^{n-1}$  to produce  $2^{n-1}$  of reaction products,

(2a65a) performing polymerase chain reaction by using an oligomer having the (2j-1)th partial sequence from the 5' end of the target sequence and an oligomer having a nucleotide sequence complementary to the (2j)th partial sequence from the 5' end of the

target sequence under such a condition that these oligomers should act as primers and templates for a polymerase enzyme in the polymerase chain reaction,

(376) repeating the following step (3a6a) for i-successive i's, wherein i increases by a single integer for each repetition and wherein i is an integer, to be from 2 to n:

(3a6a) repeating the following steps (3ai6ai) and (6aii) for k-successive k's, wherein k increases by a single integer for each repetition and wherein k is an integer, to be from 1 to  $2^{n-i}$  to produce  $2^{n-i}$  of reaction products,

(3ai6ai) mixing a reaction mixture containing DNA having the  $(2^i \cdot (k-1) + 1)$ th to  $(2^i \cdot (k-1/2))$ th partial sequences from the 5' end of the target sequence and a reaction mixture containing DNA having a sequence complementary to the  $(2^i \cdot (k-1/2) + 1)$ th to  $(2^i \cdot k)$ th partial sequences from the 5' end of the target sequence, and

(6aii) performing polymerase chain reaction under such a condition that DNAs contained in the reaction mixtures should act as primers and templates, and

(47) separating DNAs having a length expected from the target sequence from the reaction mixture, and

(8) sequencing the separated double strand DNAs to select a double strand DNA having the target sequence, thereby producing DNA having the target sequence.

3. (Currently amended) The method according to Claim 2, wherein, in the steps (2a5a) and (3ai6ai), a ratio of the oligomers added to the reaction mixture or a ratio of the reaction mixtures to be mixed is adjusted so that a single strand DNA required for a subsequent step should be synthesized in an amount larger than that of the other single strand DNA.